
The Influence Of Sweet Orange (*Citrus Sinensis*) Aromatherapy On The Anxiety Levels Of Prospective Contraceptive Implant Recipients At Maja Health Center, Lebak District In 2025

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Abstract

*The coverage of long-acting contraceptive methods (LARC) in Indonesia in 2024 reached only 14.27% and remains uneven across regions. One of the barriers to its use is anxiety caused by fear and pain during the insertion of contraceptive implants. Sweet orange (*Citrus sinensis*) aromatherapy can serve as a non-pharmacological approach to reduce anxiety. To examine the effect of sweet orange (*Citrus sinensis*) aromatherapy on the anxiety levels of prospective implant contraceptive acceptors at Maja Public Health Center, Lebak Regency, in 2025. This study used a pre-experimental one-group pretest-posttest design. consisted of 35 women registered as prospective contraceptive implant acceptors. Sampling: used a total sampling technique with accidental sampling. included the HRS-A questionnaire and aromatherapy SOP. Using the Wilcoxon Signed Rank Test. The mean anxiety score decreased from 20.00 (SD: 6.60) before the intervention to 11.94 (SD: 4.84) after the intervention, with a p-value < .001. Sweet orange (*Citrus sinensis*) aromatherapy significantly reduces anxiety in women prior to implant contraceptive procedures. Recommendation: It is suggested as an evidence-based non-pharmacological therapy to help manage anxiety during contraceptive implant insertion.*

Keywords: Anxiety; Prospective Implant Contraceptive Container; Sweet Orange Aromatherapy

INTRODUCTION

The number of maternal deaths has increased from 2021 to 2023, with the maternal mortality rate (MMR) in 2023 reaching 4,482 cases. One of the main causes is a risky pregnancy known as 4T, which is too young, too old, too close, and too much. Contraceptives function to prevent unplanned pregnancies and reduce potential risks to the health of the mother and baby. However, there are still many women who do not use it, so they remain vulnerable to risky pregnancies that contribute to the high maternal mortality rate (Indonesian Statistics Agency, 2024). According to the *World Health Organization* (WHO) in 2023, for married or married women, the global prevalence of contraception with modern methods (contraceptive pills, injections, implants/AKBK, IUDs/AKDR, tubectomy, vasectomy) is 58.7% and with other methods is 65%. In 2021, the number of Women of Childbearing Age (WUS) aged 15-49 years in the world reached 1.9 billion. Of these, 1.1 billion women need contraceptives, and 874 million of them already use them. However, there are still about 164 million women who have not been able to access or be eligible to use contraception (WHO, 2023).

According to the Central Statistics Agency of Banten Province in 2024, the use of modern and traditional family planning by WUS aged 15-49 years in Banten Province will reach 58.61%, while 26.02% do not use contraception. In Lebak Regency, the number of family planning users is higher, at 69.60%, but 17.91% still do not use contraception. This data shows that this achievement is still far from the target which should reach 78.90% (Banten Provincial Central Statistics Agency, 2024).

One of the obstacles to using contraceptives is the anxiety that women often experience. This anxiety arises due to stress, uncertainty, and feelings of helplessness that impact the body. Many women feel excessively afraid of the implant birth control procedure, especially due to concerns about pain, moving or missing implants, and their lack of knowledge and experience regarding the implant process (D. Akhmad et al., 2022).

According to research conducted by Maulinda & Anggraini (2024), anxiety plays a role in the selection of MKJP, with employment and education status correlated with anxiety levels in WUS, but age does not have a significant effect. Meanwhile, according to research by Nur et al (2022), age,

lifestyle, expected number of children, experience using contraception, social culture, attitudes, and partner support can also affect contraceptive use. Health factors can also affect contraceptive use, such as menstrual history, family health problems, and other health conditions.

Methods that can be applied in reducing anxiety levels are *non-pharmacological methods* in the form of aromatherapy. Essential oils are used in aromatherapy to promote physical health, calm the mind, and aid in the relaxation process. Its mechanism of action is through inhalation that activates olfactory chemoreceptors in the nose. Signals are then sent to the brain through the olfactory lobe, affecting the hypothalamus and hippocampus. This process has an impact on the central nervous system and blood circulation. Inhaled volatile orange molecules activate sensory neurons and reduce anxiety (Agarwal et al., 2022).

One aromatherapy that can be used is sweet orange (*Citrus sinensis*) which is rich in active secondary metabolites for treatment *Nonpharmacology* (Mannucci et al., 2018). The main content is *Lemonade* (96.77%) which is beneficial in relieving pain, nausea, vomiting, anxiety, stress, and insomnia. Inhaling orange essential oil for 90 seconds is proven Lower The concentration of oxyhemoglobin in the right prefrontal cortex, resulting in a sense of comfort and relaxation. In addition, sweet oranges have antidepressant effects that help with mild stress (Grace Sipahelut et al., 2022).

The results of a *pre-research study* in one of the work areas of the Maja Health Center through interviews with 10 people showed that 6 out of 10 people felt anxious so that mothers were not interested in using implantable birth control. This anxiety is triggered by a lack of knowledge, rumors and myths that implants can be switched, as well as concerns about the pain caused by the incision during insertion, which is the main source of fear in choosing contraception.

In this study, there is still anxiety in women in using contraceptives, fear of side effects and lack of accurate information exacerbate anxiety. Cultural and social factors also influence negative perceptions of contraception. In addition, economic conditions play a role in the decision to use contraceptives. Although health services are available, there are still barriers to receiving contraception.

Research Objectives

The main purpose of this study is to determine the effect of providing sweet orange aromatherapy (*Citrus sinensis*) on the level of anxiety of prospective Implant Family Planning acceptors at the Maja Health Center, Lebak Regency in 2025.

RESEARCH METHODS

This type of research is a quantitative research with a *Pre-Experimental method* using the One Group Pretest-Posttest Design *research design*. The population in this study is 35 women who are prospective implant birth control acceptors. The research sample was determined by *the total sampling method* using *the accidental sampling technique*. This research was conducted in May 2025 in a family planning safari activity with prospective adoptive mothers of implant family planning acceptors at the Maja Health Center, Maja District, Lebak Regency. The data collection tool for this study, the HRS-A questionnaire was used to measure anxiety levels. The standard tool for measuring anxiety is *the Hamilton Rating Scale for Anxiety* (HRS-A), which was created by Max Hamilton in 1959. There is evidence that this scale is both valid and high reliability, so it is applied in *clinical trial research*. The administration of aromatherapy in this study was carried out in accordance with the Standard Operating Procedures (SOP) referring to the research of Nisa & Hidayani (2023) including the definition, objectives, respondent criteria, preparation of tools and materials, and procedures for administering aromatherapy using a diffuser with sweet orange essential oil (*Citrus sinensis*). The data analysis used in this study is univariate and bivariate analysis. The statistical test used is *the Wilcoxon signed Rank Test*.

RESULTS AND DISCUSSION

Table 1. Average Anxiety Level of Prospective Implant Family Planning Acceptors Before and After Sweet Orange Aromatherapy (*Citrus sinensis*) at Maja Health Center, Lebak Regency

Variable	N	Min	Max	Red	OR	SD
Pretest HRS-A	35	10.00	37.00	20.00	1.12	6.60
Posttest HRS-A	35	4.00	23.00	11.94	0.82	4.84

Based on table 1, it is known that the number of respondents in this study is 35 people. The results before (*pretest*) showed an average anxiety score of 20.00 with a standard deviation (SD) of 6.60 and a *standard error* (SE) of 1.12, with a low score of 10.00 and a high of 37.00. This shows that the respondents' anxiety levels experienced moderate to high levels of anxiety before the intervention. After (*posttest*) the sweet orange aromatherapy was given, the average anxiety score decreased to 11.94 with SD 4.84 and SE 0.82. The anxiety score range was also lower, at 4.00 to 23.00, indicating a decrease in respondents' anxiety levels after the intervention.

Table 2. The Effect of Sweet Orange Aromatherapy (*Citrus sinensis*) on the Anxiety Level of Prospective Implant Family Planning Acceptors

Variable	N	Red	SD	P-Value	CI-95%
Prestest HRS-A	35	20.00	6.60	<.001	15,97
Post-test HRS-A	35	11.94	4.84		

Based on table 2, it is known that the average anxiety score decreased from before (*pretest*) 20.00 to 11.94 (*posttest*) after the administration of sweet orange aromatherapy (*Citrus sinensis*), with a difference of 15.97. Statistical tests showed a *p-value* of <.001, indicating that the difference was statistically significant.

Discussion

Anxiety Level of Prospective Implant Family Planning Acceptors Before and After Sweet Orange Aromatherapy (*Citrus Sinensis*)

The results showed that the average anxiety level before the intervention (*pretest*) was 20.00 with a standard deviation (SD) of 6.60, while after the intervention (*posttest*) decreased to 11.94 with a standard deviation (SD) of 4.84. This indicates that there is a decrease in anxiety levels.

Anxiety in women becomes an obstacle to the use of contraception. This is triggered by stress, feelings of uncertainty, and fear of side effects circulating in society (Iswari et al., 2022). This is in line with the research of D. Akhmad et al (2022) that most mothers are anxious about implant birth control procedures because they are afraid of pain and are worried that the implant will move or disappear, which is influenced by the lack of knowledge and experience about the procedure.

So to help relieve this anxiety is aromatherapy. A type of therapy that utilizes volatile compounds through inhalation to help prevent disease, infection, and anxiety, is one of the *nonpharmacological* treatments that can be used. This therapy relieves muscle tension, improves blood circulation, and is popular among Indonesians because of its benefits and relaxation effects (Grace Sipahelut et al., 2022).

This statement is supported by research conducted by Mannucci et al (2018) that clinical trials conducted on sweet oranges (*Citrus sinensis*) show that both inhalation of essential oils and oral consumption can have a positive effect in reducing anxiety symptoms. These findings support the use of sweet oranges (*Citrus sinensis*) as a safe and natural complementary therapy. Thus, sweet oranges have the potential to be used as an alternative in anxiety management (Mannucci et al., 2018).

Based on the results obtained, researchers assume that the content of oranges can stimulate the nervous system which helps to cause a relaxation effect and reduce anxiety. These aromatherapy benefits occur through the physiological and psychological effects of inhaling the volatile components

of essential oils. These active components act on the limbic system, including the hippocampus, hypothalamus, and piriform cortex, which then triggers the body's response to create calm and reduce anxiety in prospective implantable birth control acceptors.

The Effect of Sweet Orange Aromatherapy (*Citrus Sinensis*) on Reducing Anxiety Levels of Prospective Implant Family Planning Acceptors

The results of the hypothesis test with *the Wilcoxon Signed Ranks test* found that the difference in the average anxiety score of 15.97 points between before was 20.00 and after was 11.94 from the administration of sweet orange aromatherapy (*Citrus sinensis*). The *p-value* is $< .001$, which means the difference is statistically significant. Thus, an alternative hypothesis (H1) is accepted, that sweet orange aromatherapy (*Citrus sinensis*) has an effect on reducing the anxiety level of prospective implant birth control acceptors.

In this study, aromatherapy was used from sweet oranges (*Citrus sinensis*), a plant of the Rutaceae family from southern China. Sweet oranges contain a variety of active secondary metabolites that support their pharmacological effects. Its selection was based on its soothing fresh scent, but its use in research is still limited. Through inhalation, this aromatherapy is expected to provide a relaxation effect and reduce anxiety of prospective implant birth control acceptors (Mannucci et al., 2018).

Similar findings were described in a study by Agarwal et al (2022) that sweet orange aromatherapy (*Citrus sinensis*) has been used as a traditional medicine since ancient times. Various symptoms such as body aches, nausea, vomiting, anxiety, depression, stress, and insomnia are treated with aromatherapy. The use of essential oils in the treatment of various medical problems, such as fatigue, hypertension, hypotension, cognitive and psychological dysfunction. Essential oils extracted from plants are used in a controlled manner in aromatherapy with minimal side effects (Agarwal et al., 2022).

Based on the results of this study, the researcher assumes that sweet orange aromatherapy (*Citrus sinensis*) is effective in reducing anxiety of prospective implantable birth control acceptors. The content of *limonene* suppresses stress hormones and increases relaxation hormones such as serotonin and dopamine, thus creating a sense of calm. Inhalation during the procedure exerts an anxiolytic effect, making it an *effective nonpharmacological* method for anxiety management.

CONCLUSION

This showed that the average pre-intervention anxiety level of 20.00 (SD: 6.60) dropped to 11.94 (SD: 4.84) after the intervention, with a *p-value* of $< .001$ indicating that the difference was significant. Thus, sweet orange aromatherapy (*Citrus sinensis*) may be a *recommended nonpharmacological* method to help reduce anxiety in prospective implant birth control acceptors.

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